2014-06-04

Hybrid Microgrids Containing Renewable Energy Sources

Craparo, Emily

HYBRID MICROGRIDS CONTAINING RENEWABLE ENERGY SOURCES

April 18, 2014 - ME Auditorium - 1300

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Abstract

Hybrid Microgrids Containing Renewable Energy Sources

Hybrid microgrids containing renewable energy sources represent a promising option for organizations wishing to reduce costs while increasing energy security and islanding time. A prime example of such an organization is the U.S. military, which often operates in isolated areas and whose reliance on a fragile commercial electric grid is seen as a security risk. However, incorporating renewable sources into a microgrid is difficult due to their typically intermittent and unpredictable nature. We use simulation techniques to investigate the performance of a hypothetical hybrid microgrid containing both wind turbines and fossil fuel based power sources. Our simulation model produces realistic weather forecast scenarios, which we use to exercise our optimization model and predict optimal grid performance. We perform a sensitivity analysis and explore the impact of the planning horizon on solution quality for day-ahead schedule optimization.

Biography

Emily Craparo is an Assistant Professor of Operations Research at the Naval Postgraduate School. She obtained her Ph.D., S.M., and S.B. in Aeronautics & Astronautics at the Massachusetts Institute of Technology. Prior to joining the Operations Research faculty at the Naval Postgraduate School, she completed a National Research Council Postdoctoral Fellowship in the same department. Her research areas include mathematical modeling, optimization, and energy applications.

Dashi Singham is a Research Assistant Professor of Operations Research at the Naval Postgraduate School. She obtained her Ph.D. in Industrial Engineering & Operations Research at the University of California, Berkeley in 2010, and an M.A. in Statistics from Berkeley. Her B.S.E. is from Princeton University in Operations Research & Financial Engineering. Her research areas include simulation modeling and analysis and applied statistics. She is an Associate Editor at IIE Transactions, and a reviewer for Operations Research, Informs Journal on Computing, ACM Transactions on Modeling and Simulation and Naval Research Logistics. .

POC

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ADDITIONAL INFO

Emily Craparo & Dashi Singham Presentation Flyer

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Emily Craparo & Dashi Singham

Presentation Video

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